

**“METHOD OF AND APPARATUS FOR MAGNETIC THERAPY”****FIELD OF INVENTION**

THIS INVENTION relates to a method of and apparatus for magnetic therapy. The invention has particular application to the treatment of urinary problems. However, the invention is not limited to this field of use.

**BACKGROUND ART**

Magnetic therapy has been proposed for the treatment of medical conditions such as acute and chronic pain. Magnetic therapy has also been suggested for the treatment of urinary incontinence, enuresis, nocturia and other medical conditions. Apparatus in the form of garments to be worn are disclosed in Chinese Patent Specification No. 1282548. Methods and apparatus of the prior art have not provided accurate placement of magnets in relationship to appropriate locations (acupoints) on the bodies of patients to maximise efficacy of the magnetic therapy. Another shortcoming has been that magnets were easily displaced from acupoints on the body even if accurate placement of the magnets had been achieved. Methods and apparatus of the prior art have also suffered from the problem that the plurality of magnets sewn into the garments are attracted to one another with sufficient force to cause clumping of the garment, making it difficult for a patient to put the garment on.

The present invention aims to provide a method of and apparatus for magnetic therapy which alleviates one or more of the abovementioned problems. Other aims and advantages of the invention may become apparent from the following description.

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**DISCLOSURE OF THE INVENTION**

With the foregoing in view, the present invention resides broadly in apparatus for magnetic therapy applicable to a patient including:

5 magnet retaining means for retaining a magnet in a fixed disposition with respect to the magnet retaining means;

a garment having fixed thereto one or more of said magnet retaining means at a location on or in the garment which corresponds to a predetermined position with respect to the body of the patient, and

10 the garment having incorporated therewith or operatively associated therewith locating means for accurately locating the garment, and thereby, the magnet, with respect to the body of the patient.

In another aspect, the present invention resides broadly 15 in magnet retaining means for retaining magnets, the retaining means including:

a planar portion;

closeable pockets formed with the planar portion in spaced relationship to each other, each pocket being of substantially 20 the same shaped and sized to receive one or more magnets; and

wherein each pockets and planar portion co-operate for engagement with at least part of the magnet or magnets to retain the magnet or magnets in fixed relationship in each pocket.

In another aspect, the present invention resides broadly 25 in magnet retaining means for retaining a pair of magnets, the retaining means including a planar portion arranged to receive for bonding thereto respective capping portions which encapsulate

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the respective magnets between one face of the planar portion and the interior of the capping portions.

Preferably, the magnet retaining means is formed from a material having a limited flexibility, being formed into pocket engageable with at least part of a magnet to retain the magnet 5 in fixed relationship in the pocket. More preferably, the magnet retaining means includes two pockets in spaced relationship to one another, and the material and construction of the retaining means is selected to substantially prevent the two magnets when retained in the respective pockets from coming together by virtue 10 of their inherent mutually attractive force. It is preferred that the pockets be formed as a pocket pair from pliant plastics material, such as a polyolefin, for example, polypropylene. Preferably, the pocket pair includes a planar portion having formed therewith in spaced relationship closeable pockets each 15 sized to receive a magnetic disc of substantially the same size and shape. It is preferred also that the pocket pair be arranged for incorporation into the garment by sewing, textile adhesive or such like. In another form, the planar portion is arranged to receive for bonding thereto respective capping portions which 20 encapsulate the respective magnets between one face of the planar portion and the interior of the capping portions. Preferably, one magnet only is encapsulated within each pocket.

Preferably, the magnets are formed to have two opposed faces spaced from one another by a distance relatively shorter 25 than distance across the faces, and are arranged with their respective magnetic poles aligned to pass through or from one face to the other. In a preferred form, the magnets are disc-like in form, with a north pole aligned substantially with the centre of one face of the disc, and a south pole aligned substantially 30 with the centre of the other face of the disc. In such form, it is preferred that the pockets be arranged to align the discs

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substantially about a common plane with respect to one another. It is also preferred that all magnets are arranged such that, in use, their respective magnetic poles are aligned normal to the body surface of the patient. In such form, it is preferred that the respective negative north poles of each magnet be arranged 5 to be the closer one to the body of the patient when the garment is donned and worn by the patient. In another form, it is preferred that one magnet is arranged for placement against the perineal region of the patient's body with its north pole towards the patient's body and the other magnet is arranged for placement 10 against the perineal region of the patient's body with its south pole towards the patient's body.

It is also preferred that the magnets be formed from a material having a high magnetic flux density, such as "rare earth" magnets. For example, the magnets are preferably formed 15 from Neodymium-Iron-Boron material or composite. It will be appreciated that other ferromagnetic material may be used, such as Aluminium-Nickel-Cobalt, Samarium-Cobalt, Ferrite or such like.

The appropriate locations for magnetic therapy are known 20 in the art, but would typically include the lumbar, sacral, perineal and lower abdominal regions for the treatment of, for example, enuresis. For such treatment, the garment is preferably in the form of a pair of pants or underpants. A leg portion to assist in accurate positioning of the magnets about the body of 25 the patient may also be included. In such form, it is preferred that the garment locating means be formed as a locator band which in use girds the waist of the patient, the location of the locator band with respect to the pants or remainder thereof being such that the fabric of the pants be held substantially unfolded 30 and uncrumpled at least when the patient is in a standing position.

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The fabric of the garment is preferably a knitted fabric similar to that used for cotton undergarments, having a double knitted construction. Preferably, the garment includes magnet retainer pockets for fixing the magnet retainer means to the garment. The pockets are preferably formed from material having 5 a herringbone fabric or the like selected for robustness in respect of the requirement to hold the relatively rigid (that is, relative to the fabric) retaining means.

In another aspect, the present invention resides broadly in a method of magnetic therapy for magnetic therapy patients 10 including:

locating one or more magnets in operative disposition with respect to one or more acupoints of the patients body;

holding the one or more magnets in said operative disposition by magnet retaining means which retain said one or 15 more magnets in substantially fixed relationship with respect to said one or more magnet retaining means;

fixing said one or more magnet retaining means to a garment worn by the patient; and

locating the garment on the patient by garment locating 20 means incorporated with or operatively associated with said garment.

Preferably, the method incorporates the patient donning and wearing the garment having the magnet retaining means fixed thereto with the magnets retained in the magnet retaining means.

25 In another aspect, the present invention resides broadly in a magnetic therapy garment for treatment of a medical condition of a patient, the garment including:

a textile portion;

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one or more magnets held by a mounting member or members for coupling the or each magnet to said textile portion at one or more predetermined locations corresponding to the location of acupoints on the body of the patient when the garment is worn by the patient.

5 Preferably, the textile portion is formed from a textile fabric material having about 87% to 88% cotton and between about 11% and about 12% elastane. Preferably, the textile portion includes a locator band. When provided in the form of pants or underpants, the locator band is preferably arranged just below 10 or spaced below the waistband of the pants for location of the locator band just above the patient's hip bone or periphery of the xiphoid process. In such form, the location of the magnets in relation to the patient are selected to be in register with 15 acupoints known to be efficacious in the treatment of medical conditions in the pelvic region, such as acute and chronic pain, urinary incontinence, enuresis, nocturia and the like.

#### BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be more readily understood and put into practical effect, reference will now be made to the 20 accompanying drawings which are illustrative of a preferred embodiment of the invention and wherein:

Fig. 1 is a view showing the front and side of a garment according to the invention, also being shown in relation to its position on a patient;

25 Fig. 2 is a rear view of the garment of Fig. 1;

Fig. 3 is a sectional view of the garment of Fig. 1;

Fig. 4 is a flow chart exemplifying usage of a garment according to the invention with a feedback device;

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Figs. 5 and 6 show the front and rear respectively of another garment according to the invention.

**DETAILED DESCRIPTION OF THE DRAWINGS**

The garment 10 shown in Fig. 1 in the form of a bikini style pants 11 having an elastic waist band 13. The pants are 5 formed from textile material that is soft to the touch and comfortable to wear. The material of the pants possesses elastic properties such that it conforms to the concords of the body region of the body 14 upon or about which the garment is worn. Such an arrangement is believed to substantially prevent 10 excessive movement of the magnets coupled to the garment away from their intended position adjacent the relevant region of the body. The material of the pants shown in Figs. 1 to 3 is about 54% polyester, about 30% and about 16% elastine (such as LYCRA or SPANDEX), has been found to be particularly effective in 15 fulfilling the requirements necessary for the placement and lack of displacement of the magnets. However, alternative materials such 87% to 88% cotton and about 11% to 12% elastine has also been found to be suitable to suit such requirements. The material is elasticised in two directions ("two-way stretch"), the 20 material being provided in a single layer.

The garment incorporates 16 magnets shown typically at 16 located at predetermined locations on the underpants to lie adjacent to the body generally in the region of the acupoints which are relevant to the condition to be treated. The magnets 25 are selected to have a magnetic field sufficiently strong to penetrate the skin and tissue and stimulant the acupoints to treat the condition. The magnets are disclike in form having a diameter between about 10 mm and 25 mm and a thickness between about 2 mm and 5 mm. Magnets having a diameter of about 10 mm and 30 a thickness of about 3 mm or alternatively a diameter of about

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25 mm and a thickness of about 2 mm have been found to be particularly effective. When supplied in the form of neodymium-  
bore or the like from, for example, Australian Magnet Technology Pty Ltd, these magnets have a field strength generally between 9000 Gauss and 13000 Gauss. The magnets shown in Figs 1 to 3 have  
5 a magnetic field strength between about 10000 Gauss and about 11300 Gauss. The magnets may include a coating to protect the magnets from corrosive materials and to protect them during cleaning of the garment. A thickness of about 10 to 30 um is sufficient to protect the magnet.

10 Three pairs of magnets are mounted to the front of the underpants and four pairs of magnets are mounted to the rear of the pants as shown in Figs. 1 and 2 respectively. An additional pair of magnets is mounted to the perineal of the pants as shown in Fig. 3. The magnets on the front of the pants are arranged to  
15 lie adjacent the abdominal region of the body, whereas those mounted to the back of the pants are arranged to lie adjacent the sacral and lumbar regions. It can be seen that the upper pair of magnets are spaced lower three pairs of magnets to provide for placement above the lumbar and sacral regions respectively. The  
20 magnet pockets may be mounted to the pants by stitching or by velour-crochet type hook and loop fasteners.

In order to maintain the magnets rigidly in position and prevent the magnets deforming the article due to their mutually attractive magnetic force, the magnets are retained in retaining  
25 means in the form of a rigid strip 12 used to retain a pair of magnets for mounting to the pants. The strip is manufactured from polyurethane, PVC or other rigid like polymer. The strip may contain a number of slits into which magnets may be inserted as shown in Fig. 5. Alternatively the strip may be formed from two  
30 separate strip portions bonded together sandwiching the magnets in between. One strip may have moulded recesses to accommodate

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the magnets and the second portion may be substantially planar and bonded by the first by solvent corfuson welding.

Each strip is removably inserted into pockets attached to the material of the pants, but may be stitched to the pants instead or as well. The pockets are formed from non-stretch material to prevent the magnets from turning over or twisting so that the whole preselected line for lying adjacent the body is not accidentally reversed. It is believed that having the retaining means arranged transverse the bisecting plain of the pants has been found to more effectively prevent clumping of the magnets. Substantially horizontal orientation of the magnets on the sacral and lumber areas has been found to provide for un-clumping of the magnets naturally when the pants are pulled up by a patient. The magnets are spaced about 12 mm apart with the negative north pole of each magnet facing the skin.

15 The alternative garment 20 shown in Figs 6 and 7 is the same in nearly every respect to the garment 10 in respect of Figs 1 to 3, with like parts or portions being referred to by the same reference numerals. However, the alternative garment further includes a locator band 21 for accurately retaining the 20 garment on the body of the user or patient. The locator band passes across the upper extremity of the xiphoid process or hip bone. The alternative garment also includes short leg portions 22 to assist in retaining the garment in the required position. The leg portions include leg bands 23 to encircle the upper 25 region of the thighs of the patient.

In use, one or more articles or garments according to the invention may be on or about the body, each article having at least one, but preferably a plurality of magnets to stimulate at least one, but preferably a plurality of acupoints to treat a 30 medical condition or several medical conditions.

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The apparatus of the present invention may also be used in conjunction with a feedback device including, for example, a probe for insertion into a cavity of the pelvic region. Such probes are preferably inflatable or expandable, but with indicator means for indicating the pressure applied to the device 5 by the patient when inserted into the pelvic cavity, normally the vaginal cavity, but possibly the rectal cavity. The device may be used in conjunction with an exercise program for exercising the patients pelvic floor muscles. For example, exercises known as Kegel exercises may be incorporated into a therapeutic regime 10 for the patient in conjunction with the wearing of apparatus according to the invention and the feedback device whereby the indicator means may be observed to confirm correct contraction of the appropriate pelvic floor muscles of the patient.

Accordingly, the invention further involves a system for 15 the treatment of at least one medical condition comprising one or more articles or garments according to the invention worn adjacent a region of the body that comprises at least one acupoint related to the medical condition being treated. In relation thereto, and in particular with reference to Fig. 4, the 20 garment may be worn for a specified period of time, the feedback device employed to correctly identify pelvic floor muscles to be exercised. Once the patient has correctly identified the muscles to be exercised, that can be exercised on a regular basis. The feed back device may also be used to provide resistance for 25 pelvic floor muscle exercises to enhance the tone of the muscles.

Specific acupoints selected may include those as described in acupuncture charts published by the China Culture Corporation 5 Edition (1996) ISBN 962 205 002 6. It is not necessary to stimulate, individual acupoints, but rather one or more suitably 30 oriented magnets or suitable magnetic field strength can be employed to stimulate several acupoints in a region of the body

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related to the medical condition being treated. The relevant region of the body is thus flooded by the magnetic field from the magnet or magnet.

Since pelvic floor muscles are known to aid treatment of such medical conditions in the pelvic region as urinal and faecal 5 incontinence and enuresis, pelvic floor exercises may be employed with the present inventions. When a feedback device in the form of a probe is inserted into the vaginal or anal cavity or the pelvic region it may be expanded or inflated, the level of inflation being indicated on a gauge. When the pelvic floor 10 muscles are correctly identified and exercised, the gauge will register the muscular contraction. Once the muscles have been identified, they can be exercised so that they may be strengthened. The gauge can be used to determine the strength or tone of the muscles.

15 For smaller individuals, such as children, fewer magnets may be employed in garments of a smaller size. Of course large garments may have more magnets employed for larger persons. The predetermined positions of the magnets are, for example, the known acupoint in the lumber region and the acupoint on the 20 abdomen for the treatment, for example, incontinence. However, stimulation of the acupoint on the back the knee is also known to treat incontinence. Other acupoints in the ankle and lower leg are also known to be related to the treatment of at least incontinence. Accordingly, the garment may be in the form of a 25 sock covering one or more acupoints in the lower leg and the magnets may be retained or secured thereto in retaining means previously described. The treatment using the garments using the present invention involves the production of a "saturation grid" of magnetic flux with respect to the body of the patient for the 30 treatment of the medical condition.

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The embodiment described is for the purpose of illustration of the invention and so it will therefore be understood that any such modifications as would be apparent to persons skilled in the art are encompassed within the broad scope and ambit of the invention as defined by the following claims.